

The seal of the State of South Dakota is a circular emblem. It features a central landscape with a river, a windmill, and a lighthouse. Above the landscape is a banner that reads "UNDER GOD THE PEOPLE RULE". The outer ring of the seal contains the text "STATE OF SOUTH DAKOTA" at the top and "GREAT SEAL" at the bottom, separated by two stars. The year "1889" is inscribed at the bottom of the seal.

# **STATEMENT OF BASIS**

## **Minor Air Quality Permit Permit Renewal**

**Twin City Fan and Blower Company  
Brookings, South Dakota**

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## 1.0 Operational Description

Twin City Fan and Blower Company (Twin City Fan) manufactures commercial and industrial fans and blowers at its facility in Brookings, South Dakota. The primary Standard Industrial Code (SIC) for the facility is 3564 – General Industrial Machinery and Equipment – Industrial and Commercial Fans and Blowers and Air Purification Equipment.

Twin City Fan fabricates fans and blowers from mild steel, aluminum, and stainless steel. The operations at the facility include cutting and forming sheet metal, welding, and grinding machine parts. The parts are then assembled, cleaned with a phosphate cleaning solution, and painted. The paints at the facility include powder coats, enamels, water based paints, epoxies, and primers.

### 1.1 Existing Equipment

Table 1.1 provides a description of the existing permitted equipment at Twin City Fan's facility in Brookings, as outlined in Twin City Fan's January 3, 2007, minor air quality permit.

***Table 1.1 – Existing Permitted Equipment Information***

Unit	Description	Maximum Operating Rate	Control Device
#1	1984 JBI Inc., dry blanket paint arrestor booth, model DB1814.	Not applicable	Dry filter pads are used to control particulate emissions.
#2	1985 JBI Inc., dry blanket paint arrestor booth, model DB-2516-S.	Not applicable	Dry filter pads are used to control particulate emissions.
#3	1987 Texas Spray Booth, dry blanket paint arrestor booth, model 4D/24/14/25.	Not applicable	Dry filter pads are used to control particulate emissions.
#4	1989 Logan Valley, dry blanket paint arrestor booth, model 2516202F.	Not applicable	Dry filter pads are used to control particulate emissions.
#5	Custom made blast booth using steel shot.	1 ton per hour.	1981 General Resource Corp., model 14042.8, reverse air baghouse.

Twin City Fan was issued a minor air quality permit with enforceable limits on January 3, 2007 to avoid the Title V air quality permit program. On May 25, 2012, the Department of Environment and Natural Resources (Department) received Twin City Fan's application to renew its minor air quality permit for the units in Table 1-1.

The facility also operates electric arc welders and grinders. In accordance with ARSD 74:36:05:04.01(7) and 74:36:04:03(10), a unit that has the potential to emit two tons or less per year of any criteria pollutant before the application of control equipment is considered an insignificant activity does not required coverage under the air quality permit. The potential

particulate emissions from the welders and grinders are below 2 tons per year. Therefore, the welders and grinders are considered insignificant activities.

Twin City Fan also operates a 1991 Industrial Heat Enterprises bake oven with a maximum heat input capacity of 1.5 mmBTU per hour. In accordance with ARSD 74:36:05:04.01(4) and 74:36:04:03(5), a device or apparatus that has a heat input capability of not more than 3.5 mmBtus per hour is considered an insignificant activity and does not require coverage under the air quality permit. Therefore, the bake oven is considered an insignificant activity.

## **2.0 NEW SOURCE PERFORMANCE STANDARDS**

The Department reviewed the new source performance standards (NSPS) and determined that Twin City Fan is not applicable to any NSPS at this time.

## **3.0 NEW SOURCE REVIEW**

### **3.1 New Source Review**

ARSD 74:36:10:01 states that New Source Review (NSR) regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Twin City Fan is located in Brookings, South Dakota, which is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Twin City Fan is not subject to NSR review.

## **4.0 PREVENTION OF SIGNIFICANT DETERIORATION**

### **4.1 Prevention of Significant Deterioration**

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated air pollutant. The following is a list of regulated air pollutants under the PSD program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM10);
3. Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
4. Sulfur dioxide (SO<sub>2</sub>);
5. Nitrogen oxides (NO<sub>x</sub>);
6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Fluorides
10. Sulfuric acid mist;

11. Hydrogen sulfide;
12. Reduced sulfur compounds;
13. Total reduced sulfur; and
14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated air pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated air pollutant, except for greenhouse gases.

According to the Clean Air Act, once a pollutant is regulated under any part of the Act, (as was the case with greenhouse gas emissions after the motor vehicle regulations were finalized in March 2010) major new sources or major modifications are subject to the PSD program and Title V air quality operating permit program. Under the Clean Air Act, PSD and Title V air quality operating permits are required for all sources that emit a regulated air pollutant above 100 or 250 tons per year, depending on the source. This threshold, if applied to greenhouse gases, would greatly increase the number of facilities requiring a PSD review or Title V air quality operating permit. Based on administrative necessity, EPA increased these thresholds through the “Tailoring Rule.”

On May 13, 2010, EPA issued the final version of the “Tailoring Rule” for greenhouse gas emissions. The major source threshold for greenhouse gases is listed below:

1. New PSD source because of a criteria air pollutant, the major source threshold for greenhouse gases is 75,000 tons per year of carbon dioxide equivalent or more;
2. New PSD source if greenhouse gas emissions are 100,000 tons per year of carbon dioxide equivalent or more;
3. For an existing PSD source because of a criteria air pollutant, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more;
4. For an existing non-PSD source that has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more; and
5. In addition to subsection (2) and (4), a specific greenhouse gas, without calculating the carbon dioxide equivalent, also needs to emit greater than 100 or 250 tons per year, whichever is applicable, to be regulated.

Twin City Fan is not one of the 28 named PSD source categories; therefore, its PSD threshold is 250 tons per year, except for greenhouse gases.

## **4.2 Potential Emissions**

Annual potential emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application, assuming the unit operates every hour of every day of the year or 8,760 hours per year.

### 4.3 Spray Booths

The emission factors for the spray booths were derived from the material safety data sheets for the products used in the spray booths. The potential emission rate is estimated from the amount of paint and solvent used in the spray booths and the amount of time the booths are operated. Twin City Fan identified in the permit application that the spray booths operate 16 hours per day for 5 days and 12 hours per day for 2 days of the week, 365 days per year (5,408 hours per year). Potential emissions are calculated assuming that the facility operates 24 hours per day 365 days per year (8,760 hours per year). Therefore, the potential emissions for the spray booths will be calculated by multiplying the actual emissions by the ratio in Equation 4-1.

#### *Equation 4-1 – Spray Booth Multiplying Factor*

$$\frac{8,760 \text{ potential operating hours/year}}{5,408 \text{ actual operating hours/year}} = 1.6$$

Potential uncontrolled emissions are those that would occur with no emission controls. Dry filter media are used to control particulate matter; however, the filters do not control volatile organic compounds (VOCs). Table 4-1 provides a summary of the potential emissions from the spray booths.

**Table 4-1 – Spray Booth Potential Emissions (tons per year)**

Pollutant	Actual emissions <sup>1</sup>	Potential emissions
Total VOCs	26.9	43.0

<sup>1</sup> - The actual emissions were provided in the application and are based on the products used for calendar year 2011.

### 4.4 Blast Booth

The blast booth baghouse collects approximately one 55 gallon drum of ash every two months and each drum contains approximately 2,000 pounds of ash. The baghouse is 99.97 percent efficient. Therefore, using the ratio calculated in the paint booth section to account for the actual operational hours per year, the potential uncontrolled particulate emissions from the blast booth are calculated using the following equation:

$$\text{Uncontrolled PM} = \frac{2,000 \text{ pounds}}{2 \text{ months}} \times \frac{12 \text{ months}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ pounds}} \times \frac{1}{0.9997} \times 1.6 = 9.6 \text{ tons/year}$$

The potential controlled emissions from the blast booth are calculated as follows:

$$\text{Controlled PM} = 9.6 \text{ tons/year} \times (1 - 0.9997) = 0.003 \text{ tons per year}$$

## 4.5 PSD Summary

Twin City Fan's potential volatile organic compound and particulate emissions are less than 250 tons per year; therefore, Twin City Fan is considered a minor source under the PSD program and is not subject to PSD requirements.

## 5.0 National Emission Standards for Hazardous Air Pollutants

The Department reviewed 40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants and determined that Twin City Fan is not applicable to any subparts at this time.

## 6.0 Maximum Achievable Control Technology Standards

### 6.1 Potential HAP Emissions

The federal Maximum Achievable Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is defined as having the potential to emit 10 tons or more per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants.

The emission factors for the spray booths were derived from the material safety data sheets for the products used in the spray booths. The potential emission rate is estimated from the amount of paint and solvent used in the spray booths and the amount of time the booths are operated. Twin City Fan identified in the permit application that the spray booths operate 16 hours per day for 5 days and 12 hours per day for 2 days of the week, 365 days per year (5,408 hours per year). Potential emissions are calculated assuming that the facility operates 24 hours per day 365 days per year (8,760 hours per year). Therefore, the potential emissions for the spray booths will be calculated by multiplying the actual emissions by the ratio in Equation 4-1.

Potential uncontrolled emissions are those that would occur with no emission controls. Dry filter media are used to control particulate matter; however, the filters do not control hazardous air pollutant emissions. Table 6-1 provides a summary of the potential emissions from the spray booths.

**Table 6-1 – Spray Booth Potential Emissions (tons per year)**

<b>Pollutant</b>	<b>Actual emissions<sup>1</sup></b>	<b>Potential emissions</b>
Hazardous Air Pollutants		
Xylene	5.3	8.5
Methyl Alcohol	0.1	0.2
Methyl Isobutyl Ketone	1.6	2.6
Ethyl Benzene	1.8	2.9
Toluene	0.4	0.6
<b>Total Hazardous Air Pollutants<sup>2</sup></b>	<b>9.9</b>	<b>15.8</b>

<sup>1</sup>- The actual emissions were provided in the application and are based on the products used for calendar year 2011.

<sup>2</sup> – Twin City Fan’s application lists methyl ethyl ketone (MEK) as a hazardous air pollutant. On December 19, 2005, EPA removed methyl ethyl ketone from the list of hazardous air pollutants. The department subtracted the methyl ethyl ketone from Twin City Fan’s actual emission calculations.

Based on Table 6-1, Twin City Fan is considered an area source of hazardous air pollutants. Twin City Fan’s minor air quality permit issued on January 3, 2007, limits the hazardous air pollutants to less than the major source threshold. Even though these limits may no longer be necessary for Twin City Fan to maintain its area source status, the Department will include these limits in the permit because the potential xylene emissions are approaching the 10 tons per year threshold and because Twin City Fan did not request these limits to be removed.

The Department reviewed the maximum achievable control technology (MACT) standards and determined that the following standards may be applicable.

## **6.2 ARSD 74:36:08:37 – 40 CFR Part 63, Subpart MMMM**

40 CFR Part 63, Subpart MMMM is subject to owners or operators of miscellaneous metal parts and product surface coating facilities located at a major source of hazardous air pollutants.

Twin City Fan is not considered a major source of hazardous air pollutants emissions and, therefore, is not subject to this subpart.

## **6.3 ARSD 74:36:08:108 – 40 CFR Part 63, Subpart HHHHHH**

40 CFR Part 63, Subpart HHHHHH, the National Emission Standards for Paint Stripping and Miscellaneous Surface Coating Operations, is applicable to area sources that engage in any of the following:

- 1) Paint stripping operations that use Methylene Chloride (MeCl)- containing paint stripping formulations;
- 2) Spray application of coatings to motor vehicles and mobile equipment
- 3) Spray application of coatings to a plastic and/or metal substrate where the coatings contain compounds of Chromium (Cr), Lead (Pb), Manganese (Mn), Nickel (Ni), or Cadmium (Cd).

Twin City Fan does not use methylene chloride for any paint stripping operations. The Material Safety Data Sheets submitted by Twin City Fan for the various paints and coatings indicate that the paints and coatings do not contain compounds of chromium, lead, manganese, nickel, or cadmium. Twin City Fan does not apply coatings to motor vehicles or mobile equipment. Therefore, Twin City Fan is not subject to this subpart.



## **6.4 ARSD 74:36:08:119 – 40 CFR Part 63, Subpart XXXXXX**

40 CFR Part 63, Subpart XXXXXX is applicable to owners or operators for the control of hazardous air pollutants for nine metal fabrication and finishing area source categories. The provisions of this subpart are applicable to an area source that is primarily engaged in the operations in one of the following nine source categories:

1. Electrical and Electronic Equipment Finishing Operations (NAICS codes 335999 and 335312);
2. Fabricated Metal Products (NAICS codes 332117 and 332999);
3. Fabricated Plate Work (Boiler Shops) (NAICS codes 332313, 332410, and 332420);
4. Fabricated Structural Metal Manufacturing (NAICS code 332312);
5. Heating Equipment, except Electric ((NAICS code 333414);
6. Industrial Machinery and Equipment Finishing Operations (NAICS codes 333120, 333132 and 333911);
7. Iron and Steel Forging (NAICS code 33211);
8. Primary Metal products Manufacturing (NAICS code 332618); and
9. Valves and Pipe Fittings (NAICS code 332919).

The provisions of this subpart are applicable to new and existing sources primarily engaged in one of the nine operations listed above that use materials that contain or have the potential to emit metal fabrication or finishing metal hazardous air pollutants. Twin City Fan has a Standard Industrial Classification (SIC) Code of 3564 and a North American Industry Classification System (NAICS) code of 333411. Twin City Fan is not one of the nine operations applicable to this subpart.

## **7.0 State Air Emission Limits**

### **7.1 State Requirements**

Visible emissions are applicable to any unit that discharges to the ambient air. In accordance with ARSD 74:36:12, a facility may not discharge into the ambient air more than 20 percent opacity for all units. Twin City Fan must control the opacity at less than 20 percent for the all units.

Twin City Fan does not have any units which use combustible fuel. Therefore, Twin City Fan is not subject to the state's sulfur dioxide emission limits. However, Unit #5, the blast booth, is subject to the state's particulate emission limit which is based on total suspended particulate (TSP). The blast booth operates at 1 ton per hour. The particulate emission rate for the blast booth baghouse is derived from ARSD 74:36:06:03(1)(a) – Emissions rate for process industry units with process weight rates up to 60,000 pounds per hour.

The following formula is used to calculate the particulate emission limit:

$$E = 4.10 \times P^{0.67} = 4.1 \text{ lb/hr}$$

where: E= emission rate in pounds per hour; and,  
P = process weight rate in tons per hour (1 ton/hr).

The particulate emission limit for Unit #5 is compared with the potential uncontrolled and controlled emissions rates for total suspended particulate matter in Table 7-1. The comparison shows Twin City Fan is capable of meeting the state's total suspended particulate emission limit.

***Table 7-1 – Particulate Emission Rate Comparison (pounds per hour)***

<b>Pollutant</b>	<b>Potential Controlled</b>	<b>Potential Uncontrolled</b>	<b>Limit</b>
TSP	2.2	0.0007	4.1

## **7.2 Performance Testing**

Twin City Fan is required to maintain records on the amount of volatile organic compounds emitted from its operations on a monthly basis and report the results to the Department on a periodic basis. Therefore, Twin City Fan is not required to conduct performance tests.

## **7.3 Minor Source**

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:05:03 is required to obtain a Title V air quality permit. Twin City Fan's volatile organic compound (VOC) emissions are less than 100 tons per year and hazardous air pollutant (HAP) emissions are less than 10 tons per year for a single hazardous air pollutant and 25 tons per year of a combination of hazardous air pollutant. Based on the emission estimates, Twin City Fan is considered a minor source.

## **7.4 Summary of Applicable Requirements**

Any source operating in South Dakota that meets the requirements of ARSD 74:36:04:02 is required to obtain a minor air quality permit. Based on the facility's potential emissions, Twin City Fan is a minor source for volatile organic compounds because the potential emissions are greater than 25 tons per year but less than 100 tons per year. Twin City Fan is a minor source for hazardous air pollutants because the potential emissions are less than 10 tons per year for a single hazardous air pollutant and less than 25 tons per year for a combination of hazardous air pollutants. Therefore, Twin City Fan will be required to operate within the requirements stipulated in the following regulations under the minor permit program:

- ARSD 74:36:04 – Operating Permits for Minor Sources;
- ARSD 74:36:12 - Control of Visible Emissions.

## **8.0 Recommendation**

Based on the information submitted in the air quality permit application, the Department recommends that Twin City Fan's existing minor permit be renewed. Any questions on this review should be directed to Jill Riedel, Engineer II, Department of Environment and Natural Resources.